DDH for ALARO-0

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1 Changes in the code

Modified subroutines can be found on kappa in directory

`/home/mma198/ddh/src_last`

or with

`'cc_getview -p Arp -r CY32t1 -u mma198'.`

1.1 Modified modules

yomphy.F90
yomphft.F90

1.2 Modified subroutines

`su0phy.F90`
`sunddh.F90`
`sualtdh.F90`
`cpg.F90`
`cpg_dia.F90`
`mf_phys.F90`
`cptend_new.F90`
`cpdyddh.F90`
`cpphddh.F90`
`ppfidh.F90`
`aro_cpphddh.F90`

1.3 New subroutine

`alaro_iniapft.F90`

2 Namelists

2.1 NAMCT0

- NFRDHFD: number of output times, - NDHFDTS(0): length of output intervals, - NDHFDTS(i): index of output interval.

2.2 NAMOP

- LINC=.FALSE., number of output file in time steps. Historical files will have numbers in time steps as well.

2.3 NAMDDH

- `LHDDOP` =.TRUE., for limited domain,
- `LHDHKS` = .TRUE., to get budgets of water species,
- `LHDEFD` = .TRUE., to have output in file.

These three keys are mandatory, if any one of them is FALSE DDH will not work.

- `LHDLIST` = .TRUE., to have extensive output at run time. FALSE will reduce the amount of output information,
- `BDEDDH(i,j)` contains descriptions of domains. For details, pleas, see DDH documentation. Long version, written in French by J.M. Piriou and shorter, in English, by T. Kovai.

An example of the namelist can be found on voodoo in namelist file

`/home/mma198/ddh32t1/j20070606/morgane.namel.`

3 Visualisation

3.1 Extracting domain, program ddht

```
ddht -cEXTRAIT_DOMAIN -1f1 -sresul -En
```

`f1:`	DDH file name,
`resul:`	output file name, it contains only one domain,
`n:`	domain ordinal number

3.2 Scripts to extract budgets

Several scripts are written by modifying existing scripts in ddh tools, these are:

- `myddhbqv`, to extract water vapour budget,
- `ddhbql`, to extract cloud water budget,
- `ddhbqi`, to extract cloud ice budget,
- `ddhbqr`, to extract rain budget,
- `ddhbqs`, to extract snow budget.

These scripts can be find on voodoo in directory

`/home/mma198/ddh32t1/tools`

Syntax for scripts, here written for script ddhbql, is: `ddhbql fic_ddh [rep_sor]`. Where `fic_ddh` is ddh file containing data for only one domain, and `rep_sor` is directory where output files are saved. If directory is not specified, script will make directory exp.tmp.ddhbql, where 'exp' stays for fore character long experiment name, e.g., if exp="ALAD" directory name is ALAD.tmp.ddhbql.

3.3 Script for making graphs

`drawb` and `drawmb`

3.4 DDH files

DDH files, for limited domains and points, have names in the form `DHFDLeeee+nnn`, where:

`eeee`: four character long experiment name

`nnnn`: output time, in number of time steps (`LINC`=F) or hours (`LINC`=T)

3.5 Procedure

1 . Copy DDH file to your working directory

2 . Extract domain using ddht script. Result is new DDH file but with data for specified domain.

3 . In the directory with DDH file containing only one domain use scripts for extracting budgets.

4 . Using `drawb` or `drawmb` make 'epsi' files with grafs.

Script `ddhshow` is used to copy ddh file form voodoo and to extract data on one domain.